

WHAT IS CLAIMED IS:

1. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:1, (ii) the complement of the nucleotide sequence of SEQ ID NO:1; (iii) the nucleotide sequence of SEQ ID NO:2, (iv) a degenerate variant of the nucleotide sequence of SEQ ID NO:2, or (v) the complement (iii) or (iv), (vi) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:3, (vii) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:3 with conservative amino acid substitutions, and (viii) a nucleotide sequence that is the complement of (vii) or (viii).

2. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:4, (ii) the complement of the nucleotide sequence of SEQ ID NO:4, (iii) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:7, (iv) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:7 with conservative amino acid substitutions, and (iii) the complement of (i) or (ii),

wherein said isolated nucleic acid is no more than 50 kb in length.

3. An isolated nucleic acid comprising a sequence that hybridizes under high stringency conditions to a hybridization probe the nucleotide

sequence of which (i) encodes a polypeptide having the sequence of SEQ ID NO:7, (ii) encodes a polypeptide having the sequence of SEQ ID NO:7 with conservative amino acid substitutions, or (iii) is the complement of (i) or (ii),

wherein said isolated nucleic acid is no more than 50 kb in length.

4. The isolated nucleic acid of claim 3, wherein said nucleic acid, or the complement of said nucleic acid, encodes a polypeptide having metalloproteinase activity.

5. The isolated nucleic acid of claim 3, wherein said nucleic acid, or the complement of said nucleic acid, is expressed in placental tissue.

6. An isolated nucleic acid comprising at least 17 nucleotides of (i) SEQ ID NO:4 or (ii) the complement of SEQ ID NO:4,

wherein said isolated nucleic acid is no more than 50 kb in length.

7. An isolated nucleic acid comprising (i) a nucleotide sequence that encodes a peptide of at least 8 contiguous amino acids of SEQ ID NO:7, or (ii) the complement of a nucleotide sequence that encodes a peptide of at least 8 contiguous amino acids of SEQ ID NO:7,

wherein said isolated nucleic acid is no more than 50 kb in length.

8. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:8, (ii) the complement of the nucleotide sequence of SEQ ID NO:8, (iii) the nucleotide sequence of SEQ ID NO:9, (iv) a degenerate variant of the nucleotide sequence of SEQ ID NO:9, or (v) the complement (iii) or (iv), (vi) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:10, (vii) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:10 with conservative amino acid substitutions, and (viii) a nucleotide sequence that is the complement of (vi) or (vii).

9. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:11, (ii) a degenerate variant of SEQ ID NO:11, (iii) the complement of (i) or (ii), (iv) a nucleotide sequence that encodes SEQ ID NO:12, (v) a nucleotide sequence that encodes SEQ ID NO:12 with conservative substitutions, (vi) the complement of (iv) or (v),

wherein said isolated nucleic acid is no more than 50 kb in length.

10. An isolated nucleic acid comprising a nucleotide sequence (i) that encodes a polypeptide having the sequence of SEQ ID NO:14, (ii) that encodes a polypeptide having the sequence of SEQ ID NO:14 with conservative amino acid substitutions, or (iii) the complement of a nucleotide sequence that encodes a

polypeptide with the amino acid sequence of SEQ ID NO:14,

wherein wherein said isolated nucleic acid is no more than 50 kb in length.

11. An isolated nucleic acid comprising a sequence that hybridizes under high stringency conditions to a probe the nucleotide sequence of which consists of SEQ ID NO:11 or the complement of SEQ ID NO:11,

wherein said isolated nucleic acid is no more than 50 kb in length.

12. The isolated nucleic acid of claim 11, wherein said nucleic acid, or the complement of said nucleic acid, encodes a polypeptide having metalloproteinase activity.

13. The isolated nucleic acid of claim 11, wherein said nucleic acid, or the complement of said nucleic acid, is expressed in placental tissue.

14. An isolated nucleic acid comprising at least 17 nucleotides of (i) SEQ ID NO:11, (ii) a degenerate variant of SEQ ID NO:11, or (iii) the complement of (i) or (ii),

wherein said isolated nucleic acid is no more than 50 kb in length.

15. An isolated nucleic acid comprising a nucleotide sequence that (i) encodes a polypeptide having the sequence of at least 8 contiguous amino acids of SEQ ID NO:12, (ii) encodes a polypeptide having the sequence of at least 8 contiguous amino

acids of SEQ ID NO:12 with conservative amino acid substitutions, or (iii) is the complement of (i) or (ii).

16. An isolated nucleic acid comprising a nucleotide sequence at least 90% identical to SEQ ID NO:11.

17. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:15, (ii) a degenerate variant of SEQ ID NO:15, (iii) the complement of (i) or (ii), (iv) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:16, (v) a nucleotide sequence that encodes a polypeptide having the sequence of SEQ ID NO:16 with conservative amino acid substitutions, and (vi) the complement of (iv) or (v).

18. An isolated nucleic acid comprising a sequence selected from the group consisting of:

(i) the nucleotide sequence of SEQ ID NO:17, (ii) a degenerate variant of SEQ ID NO:17, (iii) the complement of (i) or (ii), (iv) a nucleotide sequence that encodes SEQ ID NO:18, (v) a nucleotide sequence that encodes SEQ ID NO:18 with conservative amino acid substitutions, and (vi) the complement of (i) or (ii).

19. The isolated nucleic acid of claim 18 wherein said nucleic acid, or the complement of said nucleic acid, encodes a polypeptide having metalloproteinase activity.

20. The isolated nucleic acid of claim 18 wherein said nucleic acid, or the complement of said nucleic acid, is expressed in placental tissue.

21. An isolated nucleic acid comprising a nucleotide sequence of no more than one fragment of SEQ ID NOs:19 to 41 or the complement of SEQ ID NOs: 19 to 41, wherein said fragment comprises at least 17 contiguous nucleotides of said SEQ ID NO: or its complement and hybridizes under high stringency conditions to a nucleic acid expressed in human placenta.

22. The isolated nucleic acid of claim 68, wherein said fragment comprises at least 50 contiguous nucleotides of said SEQ ID NO: or its complement.

23. An isolated nucleic acid comprising the nucleotide sequence of SEQ ID NO:65 or its complement, wherein said isolated nucleic acid is no more than 50 kb in length.

24. The isolated nucleic acid of any of claims 1 - 23, wherein said isolated nucleic acid is detectably labeled.

25. The isolated nucleic acid of any one of claims 1 - 23, wherein said nucleic acid is attached to a substrate.

26. A microarray, comprising: a plurality of nucleic acids addressably disposed upon a substrate,

wherein at least one of said nucleic acids is the isolated nucleic acid of any one of 1 - 23.

27. A recombinant nucleic acid vector, comprising: the isolated nucleic acid of any one of claims 1 - 23.

28. The vector of claim 27, wherein said isolated nucleic acid is operably linked to genetic elements capable of driving expression of said nucleic acid in a host cell.

29. A host cell comprising the isolated nucleic acid of any one of claims 1 - 23 or the vector of either of claims 27 - 28.

30. An isolated polypeptide, said polypeptide comprising the amino acid sequence of SEQ ID NO:3, SEQ ID NO:10, or SEQ ID NO:16.

31. An isolated polypeptide comprising a sequence of at least 8 contiguous amino acids of SEQ ID NO:7, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, or SEQ ID NO:18.

32. An antibody, said antibody selected from the group consisting of:

(i) antibodies capable of binding specifically to polypeptides comprising an amino acid sequence as provided in SEQ ID NO:7, and the binding of which can be competitively inhibited by a polypeptide the sequence of which is given in SEQ ID NO:7;

(ii) antibodies capable of binding specifically to polypeptides comprising an amino acid

sequence as provided in SEQ ID NO:14, and the binding of which can be competitively inhibited by a polypeptide the sequence of which is given in SEQ ID NO:14; and

(iii) antibodies capable of binding specifically to polypeptides comprising an amino acid sequence as provided in SEQ ID NO:18, and the binding of which can be competitively inhibited by a polypeptide the amino acid sequence of which is given in SEQ ID NO:18.

33. The antibody of claim 32, which antibody is detectably labeled.

34. A pharmaceutical composition comprising:  
the nucleic acid of any one of claims 1 - 23,  
the polypeptide of any one of claims 30 - 31, or the  
antibody of claim 32; and  
a pharmaceutically acceptable excipient.

35. A method of antenatal diagnosis of  
dysgenetic pregnancies, comprising:  
quantifying levels of PAPP-E protein  
circulating in maternal serum during first or second  
trimester of pregnancy, and  
comparing to a standard,  
decreased levels of circulating PAPP-E as compared to  
standard indicating increased likelihood of a  
dysgenetic pregnancy.

36. A method of preventing or abrogating  
pregnancy, comprising:  
vaccinating a human subject with the nucleic  
acid of any one of claims 1 - 23 or the polypeptide of



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any one of claims 30 - 31, or administering an effective amount of the antibody of claim 32.